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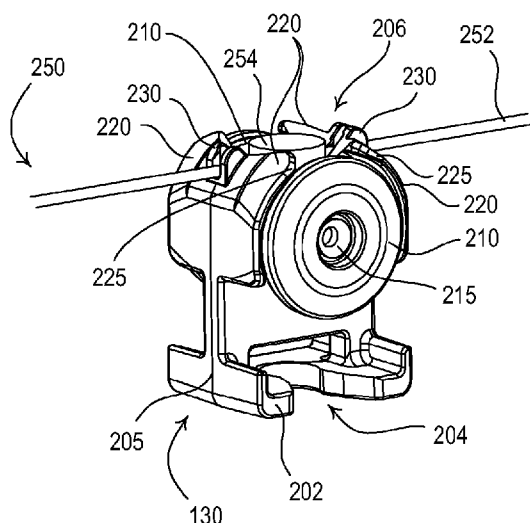


FIG. 3A

(57) Abstract: A drapery system including a fabric-support car to operate within a track of the drapery system to operate a drapery fabric between a fully-extended position and a fully-retracted position. The fabric-support car includes a pair of wheels, a lower portion with a cavity to receive a connector to connect the drapery fabric to the fabric-support car. The fabric-support car includes a pair of guides disposed on opposed sides of a recess. Each of the guides includes a pair of arms that define a channel. The channel is configured to receive a cord. The fabric-support car includes a plurality of walls that partially surround the pair of wheels. The plurality of walls prevent the cord from entangling with the pair of wheels.



FABRIC-SUPPORT CAR FOR A DRAPERY SYSTEM

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims priority to United States Provisional Application No. 63/334,802 filed in the United States of America on April 26, 2022, the entire contents are incorporated herein by reference.

BACKGROUND

[0002] Motorized drapery systems allow for movement of a suspended drapery fabric covering, for example, a window or other opening. Typical motorized drapery systems include a drive system having a reversible motor that turns a drive pulley for moving a drive belt within an elongated track. The drive belt is connected to a master car to provide for movement of the master car in two opposite directions depending on the direction that the reversible motor is driving the drive belt. The drapery fabric is attached to the master car and a plurality of auxiliary cars that do not engage the drive belt. The master car and auxiliary cars include wheels received within the track to provide rolling movement of the cars. An elongated slot is provided in the track for connection between the cars positioned within the track and Suspended drapery fabric.

[0003] Since the master car is fixedly connected to the drive belt, the drapery fabric may only be opened and closed by the drive system. Some prior art drapery systems have allowed a user to decouple the drapery fabric, such that user is able to manually adjust the position the drapery fabric (i.e., by gripping and pulling the drapery fabric). However, these systems either require multiple tracks for the master car and the auxiliary cars or require master cars of a large physical size, which prevents the drapery system from being used with all types of drapery fabrics, such as split-draw and ripple-fold draperies. Therefore, there is a need for a drapery system having a single

track and a low-profile master car, which can used with split draw and ripple-fold draperies and is able to be decoupled from the drive system when the user pulls on the drapery fabric.

SUMMARY

[0004] As described herein, a drapery system may include one or more fabric-support cars that are configured to operate within a track of the drapery system to operate a drapery fabric between a fully-extended position and a fully-retracted position. A fabric-support car (*e.g.*, an auxiliary car) may comprise a pair of wheels configured to operate along grooves of the track. The fabric-support car may comprise a body that defines a lower portion and an upper portion. The lower portion may be configured to extend through an elongated slot of the track. The lower portion may comprise a cavity that is configured to receive a connector to connect the drapery fabric to the fabric-support car. The upper portion may comprise a recess that is configured to receive a cord fastener to attach the fabric-support car to a cord of the drapery system. The fabric-support car may comprise a pair of guides disposed on opposed sides of the recess. Each of the guides may comprise a pair of arms that define a channel (*e.g.*, a guide channel). The channel may be configured to receive the cord. The fabric-support car may comprise a plurality of teeth that extend from the arms into the channel. The plurality of teeth may be configured to retain the cord within the channel.

[0005] The fabric-support car may comprise a plurality of walls that partially surround the pair of wheels. The plurality of walls may be configured to prevent a cord of the drapery system from entangling with the pair of wheels. Each of the plurality of walls may define a substantially constant gap between the respective wall and the respective wheel between an upper edge of the respective wall and a lower edge of the respective wall. Each of the plurality of walls may define a radiused edge that is distal from a midsection of the fabric-support car. The radiused edge may be configured to prevent fraying if the cord slides along the radiused edge. Each of the plurality of walls may define an extended portion proximate to the upper edge that defines a furthestmost portion of the respective wall. The extended portion may comprise a chamfered corner that is configured to prevent the cord from catching on the wall. The cord may be a cord assembly comprising the cord

and a plurality of cord fasteners at predetermined spacing along the cord. The plurality of walls may be curved about the wheels.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] FIG. 1 is a perspective view of a drapery system for movement of a suspended drapery fabric for covering an opening.

[0007] FIG. 2 is a perspective view of a plurality of auxiliary cars that are configured to be installed within a track of the drapery system of FIG. 1

[0008] FIG. 3A is a perspective view of one of the auxiliary cars of FIG. 2 for use in the drapery system of FIG. 1.

[0009] FIG. 3B is a partially exploded view of the example auxiliary car of FIG. 3A.

[0010] FIG. 3C is a side view of the example auxiliary car of FIG. 3A.

[0011] FIG. 3D is a top view of the example auxiliary car of FIG. 3A.

[0012] FIG. 4 is a side cross-section view of the example drapery system of FIG. 1 having an auxiliary car within a channel.

[0013] FIG. 5 is a front cross-section view of the example drapery system of FIG. 4.

DETAILED DESCRIPTION

[0014] FIGs. 1-5 illustrate a portion of a drapery system 100 for movement of a suspended drapery fabric (not shown) for covering an opening (*e.g.*, such as a window). FIG. 1 is a perspective view of the portion of the drapery system 100 (*e.g.*, such as a window treatment system). The drapery system 100 may be configured to be operated to move the drapery fabric in a horizontal direction between a fully-retracted position (*e.g.*, an open position or a fully-open position) in which the window is not covered by the drapery fabric and a fully-extended position (*e.g.*, a closed position or a fully-closed position) in which window is completely covered by the drapery fabric). For

example, the drapery system 100 may be configured to be manually-operated or motorized. The drapery fabric may be a ripple-fold drapery fabric having a sine wave and/or zig-zag design in the extended position (*e.g.*, when viewed from above). Additionally or alternatively, the drapery fabric may be a pinch pleat fabric or an S-fold fabric.

[0015] The drapery system 100 may comprise a track 112 that is configured to support the drapery fabric. For example, the track 112 may be configured to be secured to a structure surrounding (*e.g.*, above) the opening. The track 112 may extend the length of the opening that the drapery fabric is covering from a first end to a second end of the track 112. The track 112 may define an idler end structure 110 at the first end of the track 112. When the drapery system 100 is motorized, a drive end structure (not shown) may be provided at the second end of the track 112 and may be adapted to be coupled to a reversible motor (not shown). A drive belt 332 (FIG. 4) may extend through the drive end structure, the idler end structure 110, and belt channels 330 (FIG. 4) of the track 112 and is driven by the motor through a drive pulley (not shown) in the drive end structure. An example motorized drapery system is shown and described in greater detail in U.S. Pat. No. 7,686,063, issued Mar. 30, 2010, entitled **MOTORIZED DRAPERY SYSTEM HAVING A PULL-AWAY MASTER CAR**, the entire disclosure of which is hereby incorporated by reference. When the drapery system 100 is manually-operated, another idler end structure (not shown) may be provided at the second end of the track 112

[0016] The track 112 may define an elongated slot 116 along an inner surface 114 of the track 112. The elongated slot 116 may extend the length of the track 112 (*e.g.*, between the first end and the second end). For example, the elongated slot 116 may extend between the idler end 110 at the first end and a drive end at the second end (*e.g.*, when the drapery system 100 is motorized). In addition, the elongated slot 116 may extend between opposed idler ends at the first and second ends (*e.g.*, when the drapery system 100 is manually-operated).

[0017] The drapery system 100 may comprise one or more fabric-support cars, such as a master car 120 and a plurality of auxiliary cars 130 (*e.g.*, fabric-support cars), configured to extend through the elongated slot 116. The master car 120 may be configured to maintain a predefined spacing between an edge of the drapery fabric and the closest one of the auxiliary cars 130. For

example, the master car 120 may be configured to prevent the closest one of the auxiliary cars 130 from moving closer than the predefined spacing. For example, the master 120 may be configured to abut the closest one of the auxiliary cars 130 when it gets as close as the predefined spacing to the edge of the drapery fabric. The master car 120 may be configured to travel through a fabric-support car channel 320 (FIG. 4) within the track 112. The fabric-support car channel 320 may be referred to as a drapery car channel. The plurality of auxiliary cars 130 may also be configured to travel through the fabric-support car channel 320. Each of the auxiliary cars 130 may be configured to connect to the drapery fabric. For example, each of the auxiliary cars 130 may be configured to extend through the elongated slot 116 to connect to the drapery fabric. For example, each of the auxiliary cars 130 may be configured to receive a connector 135. The connector 135 may be configured to connect the drapery fabric to the drapery system 100 (e.g., the auxiliary cars 130). The connector 135 may be a hook, a clasp, a catch, an eye, a snap, and/or the like. The drapery fabric may comprise cooperating features to connect with the connector 135. Although one connector 135 is shown connected to one of the auxiliary cars 130 in FIG. 1, it should be appreciated that each of the auxiliary cars 130 in the drapery system 100 receive a connector 135. It should also be appreciated that the connector 135 may be integral to and a part of each of the auxiliary cars 130.

[0018] The auxiliary cars 130 (e.g., and the drapery fabric) may be configured to move in response to movements of the drive belt 332. The master car 120 may be coupled to the drive belt 332 and the auxiliary cars 130, such that the master car 120 and the auxiliary cars 130 are operable to move in response to the movements of the drive belt 332. For example, the master car 120 may be configured to travel through a channel (e.g., such as the fabric-support car channel 320) in response to operation of the drive belt 332. The master car 120 may transfer movement of the drive belt 332 to the auxiliary cars 130, for example via a cord (e.g., such as the cord 252) of the drapery system 100. Example drive systems (including the drive end of the track 112, the motor, and the drive pulley) and the auxiliary cars 130 are shown and described in greater detail in U.S. Pat. No. 6,935, 403, issued Aug. 30, 2005, and U.S. Pat. No. 6,994,145, issued Feb. 7, 2006, both entitled **MOTORIZED DRAPERY PULL SYSTEM**, the entire disclosures of which are hereby incorporated by reference.

[0019] Although the drapery system 100 depicts one master car 120, it should be appreciated that the drapery system 100 is not limited to this configuration. Instead, the drapery system 100 may comprise a plurality of master cars 120.

[0020] FIG. 2 is a perspective view of a plurality of the auxiliary cars 130 of the drapery system 100 (*e.g.*, when not installed in the fabric-support car channel 320 of the track 112). The auxiliary cars 130 may be configured to be installed within the fabric-support car channel 320 of the track 112 of the drapery system 100. The auxiliary cars 130 may be referred to as fabric-support cars and/or drapery cars that are configured to operate within the track 112 of the drapery system 100 to operate the drapery fabric between the fully-retracted position and the fully-extended position. The auxiliary cars 130 may be attached to a cord assembly 250 at a predetermined spacing. The predetermined spacing may be configured such that the auxiliary cars 130 are equally spaced along a length of the cord assembly 250. The cord assembly 250 may comprise a cord 252 with a plurality of cord fasteners 254. The cord 252 may extend through the track (*e.g.*, through the fabric-support car channel 320 of the track 112). The cord 252 may be attached to a master car (*e.g.*, such as the master car 120) of the drapery system 100. The cord fasteners 254 may be cylindrical-shaped disks (*e.g.*, pucks). The cord fasteners 254 may be attached (*e.g.*, molded) to the cord 252 at the predetermined spacing (*e.g.*, such as 80 mm). Each of the auxiliary cars 130 may be attached to the cord 252 (*e.g.*, the cord assembly 250) via the cord fasteners 254. For example, each of the auxiliary cars 130 may be configured to be attached to a respective one of the cord fasteners 254.

[0021] Each of the auxiliary cars 130 may comprise a pair of wheels 210 that are configured to operate along respective internal grooves 322 (*e.g.*, as shown in FIG. 4) within the fabric-support car channel 320 of the track 112, for example, as the drapery fabric of the drapery system 100 is operated between the fully-retracted position and the fully-extended position. The wheels 210 may be secured to the auxiliary cars 130 by an axle 215. A respective pair of wheels 210 may be configured to rotate about its axle 215, for example, as the auxiliary cars 130 move along the fabric-support car channel 320. The axle 215 may define an axis of rotation of the wheels 210.

[0022] Each of the auxiliary cars 130 may comprise a lower portion 202 that is configured to extend through the elongated slot 116 of the track 112. For example, the lower portion 202 may be

accessible from outside of the track 112 when the auxiliary cars 130 are received in the fabric-support car channel 320 of the track 112. The lower portion 202 may be configured to limit the rotational movement of the respective one of the auxiliary cars 130. For example, the lower portion 202 may prevent rotational movement of the auxiliary cars 130 beyond a predetermined angle. The auxiliary cars 130 (*e.g.*, the lower portion 202) may define a cavity 204. The cavity 204 may be configured to receive a drapery connector (*e.g.*, such as the connector 135 shown in FIG. 1), for example, to connect the drapery fabric to the respective auxiliary car 130. Each of the auxiliary cars 130 may comprise an upper portion 206 that is configured to remain within the fabric-support car channel 320 of the track 112 as the auxiliary cars 130 move along the track 112.

[0023] Each of the auxiliary cars 130 may be configured to prevent the cord 252 from becoming wrapped around an adjacent one of the auxiliary cars 130 and/or becoming tangled in the wheels 210. As the drapery fabric is operated toward the fully-extended position, each of the auxiliary cars 130 may be pushed (*e.g.*, successively pushed) toward an adjacent one of the auxiliary cars 130, for example, until the adjacent auxiliary cars 130 contact each other. When adjacent auxiliary cars 130 are proximate to one another, a section of the cord 252 between the adjacent auxiliary cars 130 may become slack within the fabric-support car channel 320 of the track 112. The auxiliary cars 130 may prevent slack sections of the cord 252 from becoming wrapped around an adjacent one of the auxiliary cars 130 and/or becoming tangled in the wheels 210.

[0024] The auxiliary cars 130 (*e.g.*, the upper portion 206) may define walls 220 that extend proximate to the wheels 210. The walls 220 may be curved about the wheels 210. For example, the walls 220 may be configured to partially surround the wheels 210. The walls 220 may be configured to guard and/or shield the wheels 210 to prevent the cord 252 from entangling with and/or wrapped around the wheels 210. The auxiliary cars 130 (*e.g.*, the upper portion 206) may define guides 230 that extend from opposed sides of the auxiliary cars 130. The cord 252 may extend through the guides 230. The guides 230 may be configured to captively retain the cord 252.

[0025] FIG. 3A is a perspective view of one of the auxiliary cars 130 attached to the cord assembly 250. FIG. 3B is a partially exploded view of the auxiliary car 130. FIG. 3C is a side view of the auxiliary car 130 (*e.g.*, when not attached to the cord assembly 250). FIG. 3D is a top view of

the auxiliary car 130 (*e.g.*, when attached to the cord assembly 250). The auxiliary cars 130 may each define a body 131 that includes the upper portion 206 and the lower portion 202. The auxiliary cars 130 may each define a recess 240 in the upper portion 206. The recess 240 may be configured to receive a cord fastener 254 to attach the respective auxiliary car 130 to the cord 252 of the cord assembly 250 of the drapery system. For example, the recess 240 of each of the auxiliary cars 130 of the drapery system 100 may be configured to receive a respective cord fastener 254 of the cord assembly 250. The recess 240 may be configured to removably retain the cord fastener 254. Additionally or alternatively, the cord fastener 254 may be secured within the recess 240 using an adhesive. The recess 240 may be defined by curved surfaces 242 of the upper portion 206. Additionally or alternatively, the cord fastener 254 may be a part of the auxiliary cars 130 (*e.g.*, such as the upper portion 206 of the auxiliary cars 130). For example, the cord fastener 254 may be configured to receive the cord 252.

[0026] Each of the plurality of walls 220 define a gap 226 between the respective wall 220 and the respective wheel 210. The gap 226 may extend from an upper edge 224 of the respective wall 220 and a lower edge 228 of the respective wall 220. The gap 226 may remain substantially constant between the upper edge 224 and the lower edge 228. The gap 226 may define a distance D1 between the respective wall 220 and the respective wheels 210. The distance D1 may be less than a diameter of the cord 252. For example, the distance D1 between the walls 220 and the wheels 210 may remain substantially the same between the upper edge 224 and the lower edge 228. The wheels 210 may define a centerline 212 that extends through the axis of rotation of the wheels 210. The walls 220 may extend a distance D2 below the centerline 212. For example, the walls 220 may surround and/or shield approximately half of the circumference defined by the wheels 210.

[0027] Each of the plurality of walls 220 may define a radiused edge 222 that is distal from a midsection 205 of the auxiliary car 130. Each of the plurality of walls 220 may extend from the midsection 205. The cord assembly 250 may follow a path 256 that extends along a direction that is parallel with the midsection 205 of the auxiliary car 130. The path 256 may define a location of the cord 252 when the auxiliary cars 130 are separated by the predetermined spacing (*e.g.*, when the

cord 252 is taut). The path 256 may define the location of the cord 252 within the auxiliary car 130. The radiused edge 222 may be configured to prevent fraying if the cord 252 slides along the radiused edge 222. Each of the plurality of walls 220 may define an extended portion 225 proximate to the upper edge 224 that defines a furthestmost portion of the respective wall 220. For example, the extended portion 225 may extend a first distance D3 from the midsection 205 (*e.g.*, and the path 256). The lower edge 228 may extend a second distance D4 from the midsection 205 (*e.g.*, and the path 256). The first distance D3 may be greater than the second distance D4. The extended portion 225 (*e.g.*, the first distance D3) may be defined by a circularly arced vertical cut through the wall 220 with the center point of the arc coincident to the centerline of the axle 215 of the wheels 210. The extended portion 225 may enable the auxiliary cars 130 to rotate about a vertical axis 235 within the track 112 to allow the auxiliary cars 130 to more easily maneuver through curved tracks which have tighter physical requirements on the size of the auxiliary cars 130. For example, the auxiliary cars 130 may be configured turn about the vertical axis 235. The extended portion 225 (*e.g.*, the first distance D3) may be configured to prevent the cord 252 from wrapping around the wheel 210. The extended portion 225 may comprise a chamfered corner 227 that is configured to prevent the cord 252 from catching on the respective wall 220. For example, the chamfered corner 227 may be defined between the upper edge 224 and the extended portion 225.

[0028] Each of the auxiliary cars 130 may comprise a pair of guides 230 that are disposed on opposed sides of the recess 240. The guides 230 may be configured to receive the cord 252. The guides 230 may be configured to prevent rotational movement of the auxiliary cars 130 within the track 112. For example, the guides 230 may extend the contact points of the auxiliary cars 130 with the cord 252. The guides 230 may prevent relative movement (*e.g.*, rotational movement) of the auxiliary cars 130 with respect to a respective cord fastener 254. The guides 230 may define the path 256. For example, the alignment between the cord fastener 254 and the guides 230 may define the path 256. The guides 230 may direct the cord 252 towards an adjacent one of the auxiliary cars 130. For example, the guides 230 may ensure that the cord 252 remains aligned with the path 256 as it leaves the respective auxiliary car 130. The guides 230 may be configured to maintain alignment of the auxiliary cars 130 with the track 112. For example, the guides 230 operate about the vertical axis 235 of the auxiliary cars 130 such that the auxiliary cars maintain alignment with a

plane defined by track 112 (*e.g.*, defined by the fabric-support car channel 320 shown in FIG. 4). Maintaining alignment between the auxiliary cars 130 and the track 112 may improve alignment of the auxiliary cars 130 within the track 112. Improving the alignment of the auxiliary cars 130 within the track 112 may keep the auxiliary cars 130 straight (*e.g.*, aligned with one another and with the fabric-support car channel 320 shown in FIG. 4) in the track 112 and prevent noise due to the auxiliary cars 130 twisting and the wheels 210 rubbing against one or more sides of the track 112. The guides 230 may be configured to move the exit point (*e.g.*, where the cord 252 leaves the guide 230) further from a center of the body 131 and/or away from the cord fastener 254. Moving the exit point further from the center of the body 131 may shorten a length of the slack portion of the cord 252 between adjacent auxiliary cars 130.

[0029] Each of the guides 230 may comprise a pair of arms 232a, 232b that define a guide channel 234. The arms 232a, 232b may extend from the upper portion 206 (*e.g.*, the walls 220) of the body 131. For example, the arms 232a, 232b may extend on opposed sides of the midsection 205 (*e.g.*, the path 256). The guide channel 234 may extend along the path 256. The channel 234 may be configured to receive the cord 252. For example, the guide channel 234 may be configured to retain the cord 252. The guides 230 (*e.g.*, the channel 234) may be configured to receive cords of various thickness.

[0030] Each of the guides 230 may comprise a plurality of teeth 236 that are configured to retain the cord 256 within the guide channel 234. For example, the teeth 236 may prevent the cord 252 from exiting the guide channel 234. The teeth 236 may pinch the cord 252 and/or extend over top of the cord 252, when the cord 252 is within the guide channel 234. The teeth 236 may extend from the arms 232a, 232b into the guide channel 234. For example, one or more of the teeth 236 may extend from arm 232a and one or more teeth 236 may extend from arm 232b.

[0031] It should be appreciated that although the guides 230 are shown not extending beyond the walls 220, the auxiliary cars 130 are not limited to this design. Rather, the guides 230 may extend up to and/or beyond the outer edges of the walls 220.

[0032] FIG. 4 is a side cross-section view and FIG. 5 is a front cross-section view of the drapery system 100. As shown in FIG. 4, the track 312 may define the fabric-support car channel 320 and the belt channels 330. When the drapery system 100 is motorized, the drive belt 332 may extend through the belt channels 330 of the track 112 and may be driven by the motor through the drive pulley in the drive end of the drapery system 100. For example, the drive belt 332 may be configured to be driven by a motor. The fabric-support car channel 320 may define the grooves 322 on opposed sides of the elongated slot 116. The wheels 210 of the auxiliary cars 130 may operate along the grooves 322 as the drapery fabric is operated between the fully-retracted position and the fully-closed position. The grooves 322 may be semi-circular, for example, as shown in FIG. 4. The fabric-support car channel 320 may prevent the wheels 210 from disengaging from the grooves 322. The fabric-support car channel 320 may be sized to prevent rotation movement of the auxiliary cars 130 within the fabric-support car channel 320. The channel 320 may provide tolerance for tilting of the auxiliary cars 130, for example, as the drapery fabric is operated. The lower portion 202 of the auxiliary cars 130 may abut the bottom surface 114 of the track 112 before the walls 220 abut the grooves 322.

CLAIMS

1. A fabric-support car for a drapery system that is configured to operate within a track of the drapery system to operate a drapery fabric between a fully-extended position and a fully-retracted position, the car comprising:
 - a pair of wheels configured to operate along grooves of the track;
 - a lower portion that is configured to extend through an elongated slot of the track;
 - an upper portion having a recess that is configured to receive a cord fastener to attach the fabric-support car to a cord of the drapery system; and
 - a pair of guides disposed on opposed sides of the recess, each of the guides comprising a pair of arms that define a channel, wherein the channel is configured to receive the cord.
2. The fabric-support car of claim 1, further comprising a plurality of teeth that extend from the arms into the channel, the plurality of teeth configured to retain the cord within the channel.
3. The fabric-support car of claim 1, further comprising a plurality of walls that partially surround the pair of wheels, the plurality of walls configured to prevent a cord of the drapery system from entangling with the pair of wheels
4. The fabric-support car of claim 3, wherein each of the plurality of walls define a substantially constant gap between the respective wall and the respective wheel from an upper edge of the respective wall to a lower edge of the respective wall.
5. The fabric-support car of claim 4, wherein each of the plurality of walls defines a radiused edge that is distal from a midsection of the fabric-support car.
6. The fabric-support car of claim 5, wherein the radiused edge is configured to prevent fraying if the cord slides along the radiused edge.

7. The fabric-support car of claim 4, wherein each of the plurality of walls defines an extended portion proximate to the upper edge that defines a furthestmost portion of the respective wall.
8. The fabric-support car of claim 7, wherein the extended portion comprises a chamfered corner that is configured to prevent the cord from catching on the wall.
9. The fabric-support car of claim 1, wherein the cord is a cord assembly comprising the cord and a plurality of cord fasteners at predetermined spacing along the cord.
10. The fabric-support car of claim 1, wherein the plurality of walls are curved about the wheels.
11. The fabric-support car of claim 1, wherein the lower portion defines a cavity that is configured to receive a connector to connect the drapery fabric to the fabric-support car.
12. A fabric-support car for a drapery system that is configured to operate within a track of the drapery system to operate a drapery fabric between a fully-extended position and a fully-retracted position, the car comprising:
 - a pair of wheels configured to operate along grooves of the track;
 - a lower portion that is configured to extend through an elongated slot of the track;
 - an upper portion having a recess that is configured to receive a cord fastener to attach the fabric-support car to a cord of the drapery system;
 - a plurality of walls that partially surround the pair of wheels, the plurality of walls configured to prevent a cord of the drapery system from entangling with the pair of wheels, wherein each of the plurality of walls define a substantially constant gap between the respective wall and the respective wheel between an upper edge of the respective wall and a lower edge of the respective wall; and
 - a pair of guides disposed on opposed sides of the recess, each of the guides comprising a pair of arms that define a channel, wherein the channel is configured to receive the cord.
13. The fabric-support car of claim 12, wherein each of the plurality of walls defines a radiused edge that is distal from a midsection of the fabric-support car.

14. The fabric-support car of claim 13, wherein the radiused edge is configured to prevent fraying if the cord slides along the radiused edge.
15. The fabric-support car of claim 12, wherein each of the plurality of walls defines an extended portion proximate to the upper edge that defines a furthestmost portion of the respective wall.
16. The fabric-support car of claim 15, wherein the extended portion comprises a chamfered corner that is configured to prevent the cord from catching on the wall.
17. The fabric-support car of claim 12, wherein the cord is a cord assembly comprising the cord and a plurality of cord fasteners at predetermined spacing along the cord.
18. The fabric-support car of claim 12, wherein each of the guides comprises a plurality of teeth that are configured to retain the cord within the channel.
19. The fabric-support car of claim 18, wherein the teeth extend from the arms into the channel.
20. The fabric-support car of claim 12, wherein the recess is configured to removably retain the cord fastener.
21. The fabric-support car of claim 12, wherein the plurality of walls are curved about the wheels.
22. The fabric-support car of claim 12, wherein the lower portion defines a cavity that is configured to receive a connector to connect the drapery fabric to the fabric-support car.

23. A fabric-support car for a drapery system that is configured to operate within a track of the drapery system to operate a drapery fabric between a fully-extended position and a fully-retracted position, the car comprising:
- a pair of wheels configured to operate along grooves of the track;
 - a lower portion that is configured to extend through an elongated slot of the track;
 - an upper portion having a recess that is configured to receive a cord fastener to attach the fabric-support car to a cord of the drapery system;
 - a pair of guides disposed on opposed sides of the recess, each of the guides comprising a pair of arms that define a channel, wherein the channel is configured to receive the cord;
 - a plurality of teeth that extend from the arms into the channel, the plurality of teeth configured to retain the cord within the channel; and
 - a plurality of walls that partially surround the pair of wheels, the plurality of walls configured to prevent a cord of the drapery system from entangling with the pair of wheels, wherein each of the plurality of walls define a substantially constant gap between the respective wall and the respective wheel from an upper edge of the respective wall and a lower edge of the respective wall.
24. The fabric-support car of claim 23, wherein each of the plurality of walls defines a radiused edge that is distal from a midsection of the fabric-support car.
25. The fabric-support car of claim 24, wherein the radiused edge is configured to prevent fraying if the cord slides along the radiused edge.
26. The fabric-support car of claim 23, wherein each of the plurality of walls defines an extended portion proximate to the upper edge that defines a furthestmost portion of the respective wall.
27. The fabric-support car of claim 26, wherein the extended portion comprises a chamfered corner that is configured to prevent the cord from catching on the wall.
28. The fabric-support car of claim 23, wherein the cord is a cord assembly comprising the cord and a plurality of cord fasteners at predetermined spacing along the cord.

29. The fabric-support car of claim 23, wherein each of the plurality of walls is curved about the respective wheel.
30. The fabric-support car of claim 23, wherein the lower portion defines a cavity that is configured to receive a connector to connect the drapery fabric to the fabric-support car.
31. A drapery system that is configured to operate a drapery fabric between a fully-extended position and a fully-retracted position, the drapery system comprising:
- a track that defines a fabric-support car channel that comprises an elongated slot;
 - a cord that extends through the fabric-support car channel of the track, the cord comprising a plurality of cord fasteners;
 - a plurality of fabric-support cars configured to extend through the elongated slot, each of the plurality of fabric-support cars attached to the cord via a respective one of the plurality of cord fasteners, wherein each of the plurality of fabric-support cars comprises:
 - a pair of wheels configured to operate along grooves of the track;
 - a lower portion that is configured to extend through the elongated slot of the track;
 - an upper portion having a recess that is configured to receive the respective cord fastener to attach the plurality of fabric-support cars to the cord; and
 - a pair of guides disposed on opposed sides of the recess, each of the guides comprising a pair of arms that define a guide channel, wherein the guide channel is configured to receive the cord.
32. The drapery system of claim 31, wherein the fabric-support car channel defines the grooves on opposed sides of the elongated slot.
33. The drapery system of claim 31, wherein the plurality of cord fasteners are attached to the cord at a predetermined spacing.

34. The drapery system of claim 33, wherein the plurality of fabric-support cars are equally spaced along the cord.
35. The drapery system of claim 31, wherein each of the plurality of fabric-support cars further comprise a plurality of teeth that extend from the arms into the guide channel, the plurality of teeth configured to retain the cord within the guide channel.
36. The drapery system of claim 31, wherein each of the plurality of fabric-support cars further comprise a plurality of walls that partially surround the pair of wheels, the plurality of walls configured to prevent a cord of the drapery system from entangling with the pair of wheels
37. The drapery system of claim 36, wherein each of the plurality of walls define a substantially constant gap between the respective wall and the respective wheel from an upper edge of the respective wall to a lower edge of the respective wall.
38. The drapery system of claim 37, wherein each of the plurality of walls defines a radiused edge that is distal from a midsection of a respective one of the plurality of fabric-support cars.
39. The drapery system of claim 38, wherein the radiused edge is configured to prevent fraying if the cord slides along the radiused edge.
40. The drapery system of claim 37, wherein each of the plurality of walls defines an extended portion proximate to the upper edge that defines a furthestmost portion of the respective wall.
41. The drapery system of claim 40, wherein the extended portion comprises a chamfered corner that is configured to prevent the cord from catching on the wall.
42. The drapery system of claim 31, wherein each of the plurality of walls is curved about the respective wheel.

43. The drapery system of claim 31, further comprising a drive belt that is configured to be driven by a motor.

44. The drapery system of claim 43, wherein each of the plurality of fabric support cars is configured to move in response to movements of the drive belt.

45. The drapery system of claim 44, further comprising a master car that is configured to travel through the fabric-support car channel in response to operation of the drive belt.

46. The drapery system of claim 45, wherein the master car is coupled to the drive belt and the cord such that the master car is configured to transfer movement of the drive belt to the plurality of fabric-support cars.

47. The drapery system of claim 31, wherein the lower portion of each of the plurality of fabric-support cars defines a cavity that is configured to receive a connector to connect the drapery fabric to the respective fabric-support car.

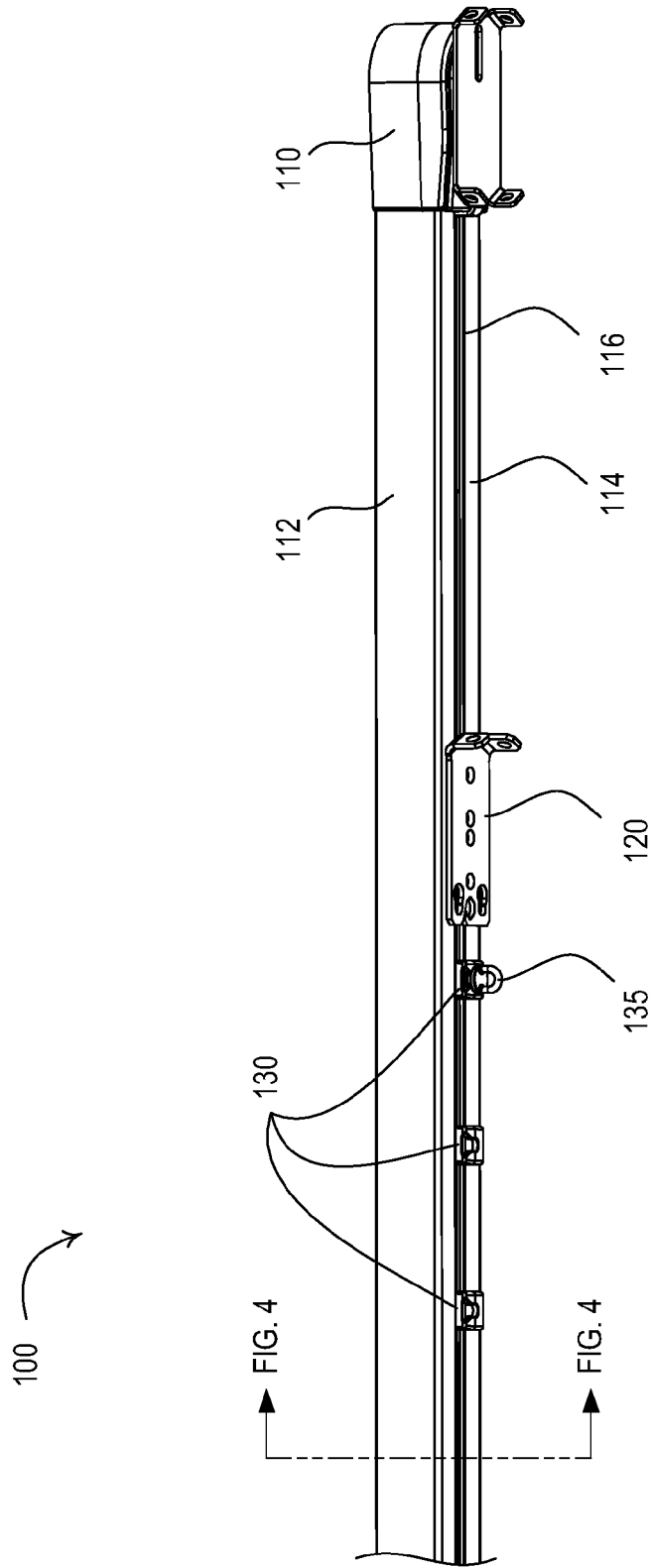


FIG. 1

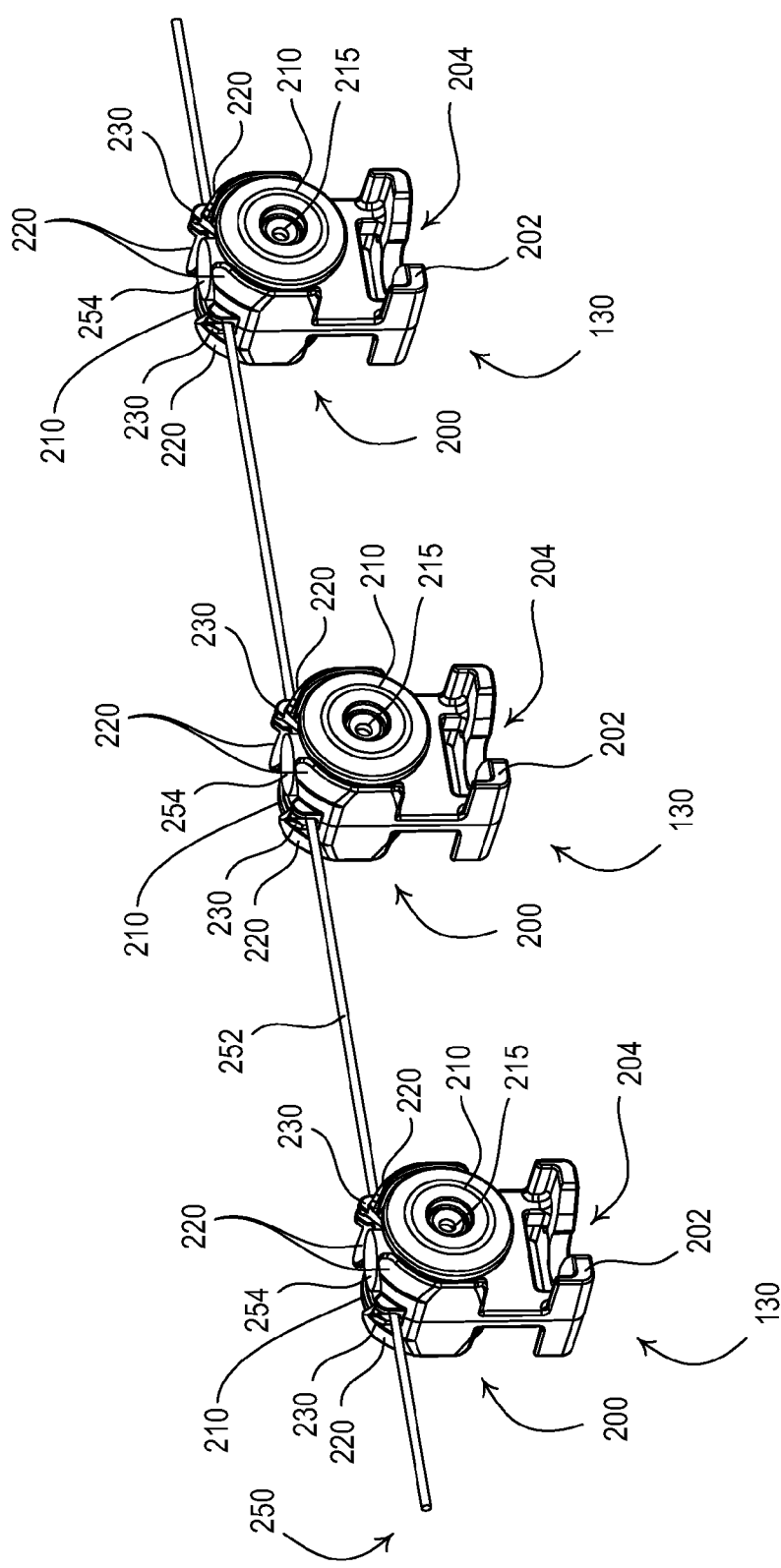


FIG. 2

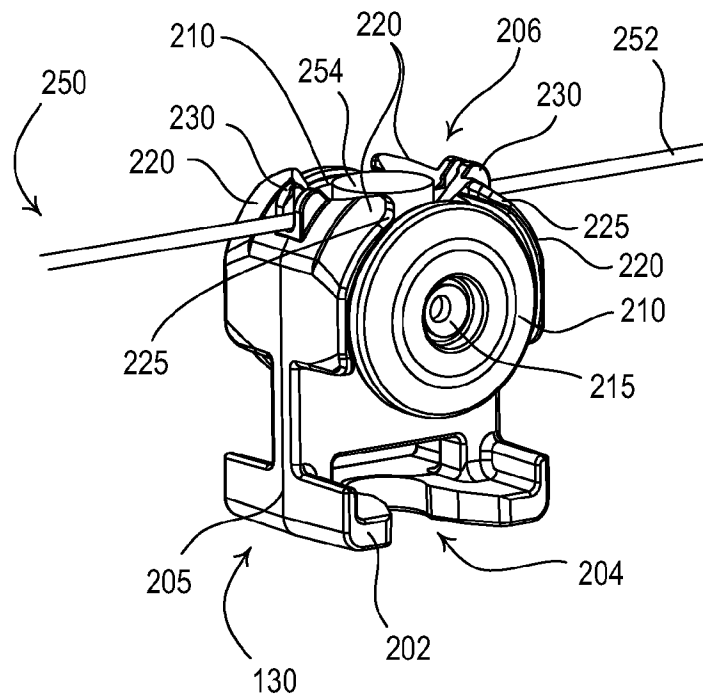


FIG. 3A

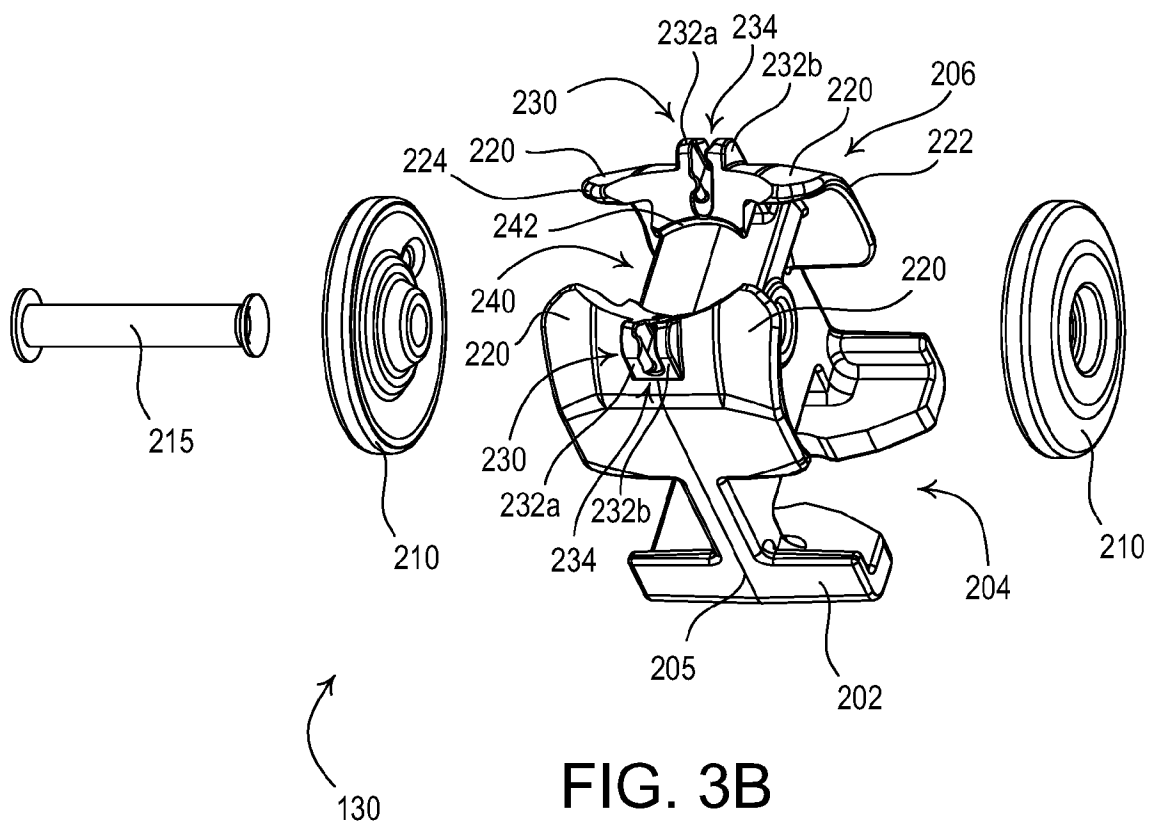


FIG. 3B

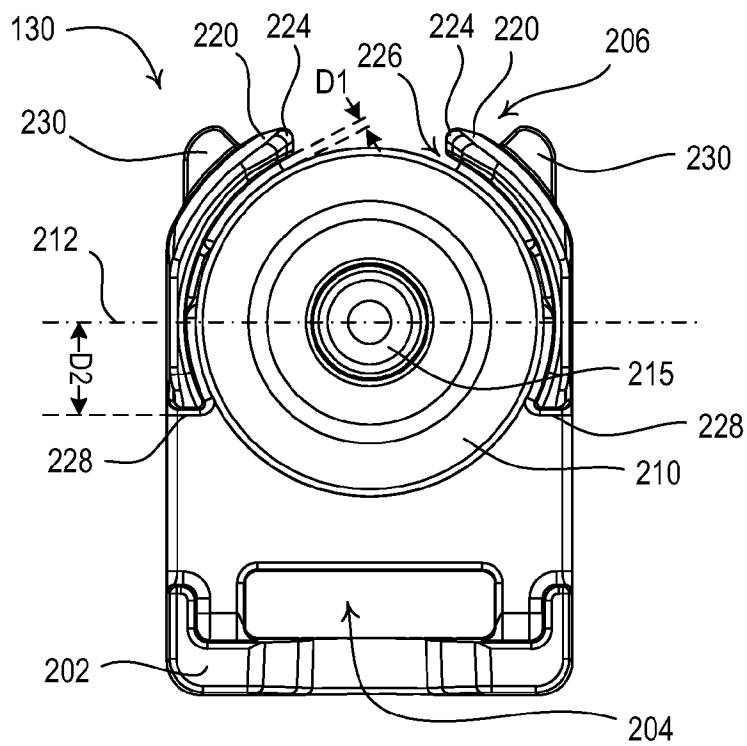


FIG. 3C

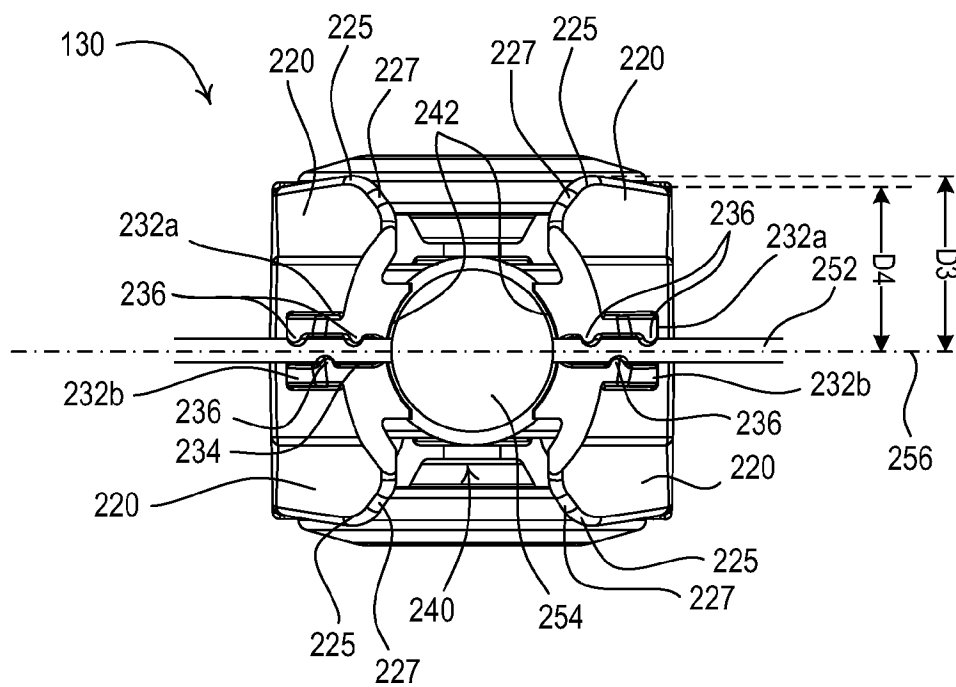


FIG. 3D

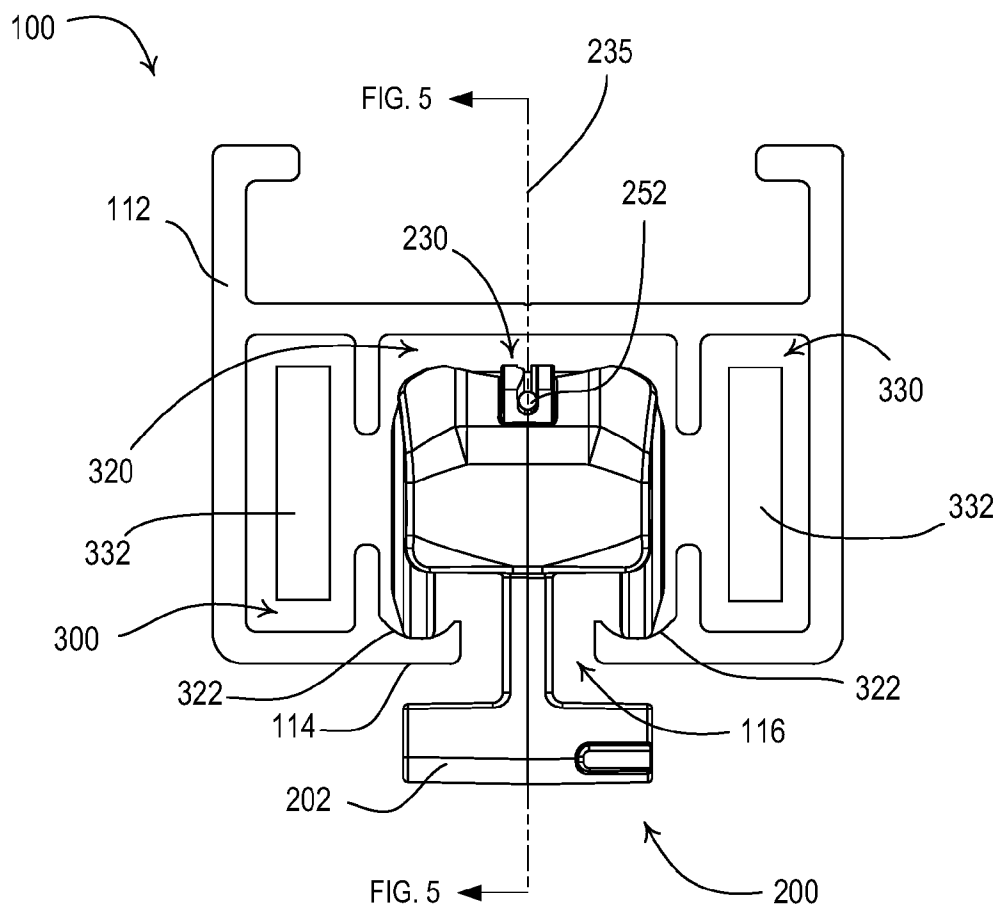


FIG. 4

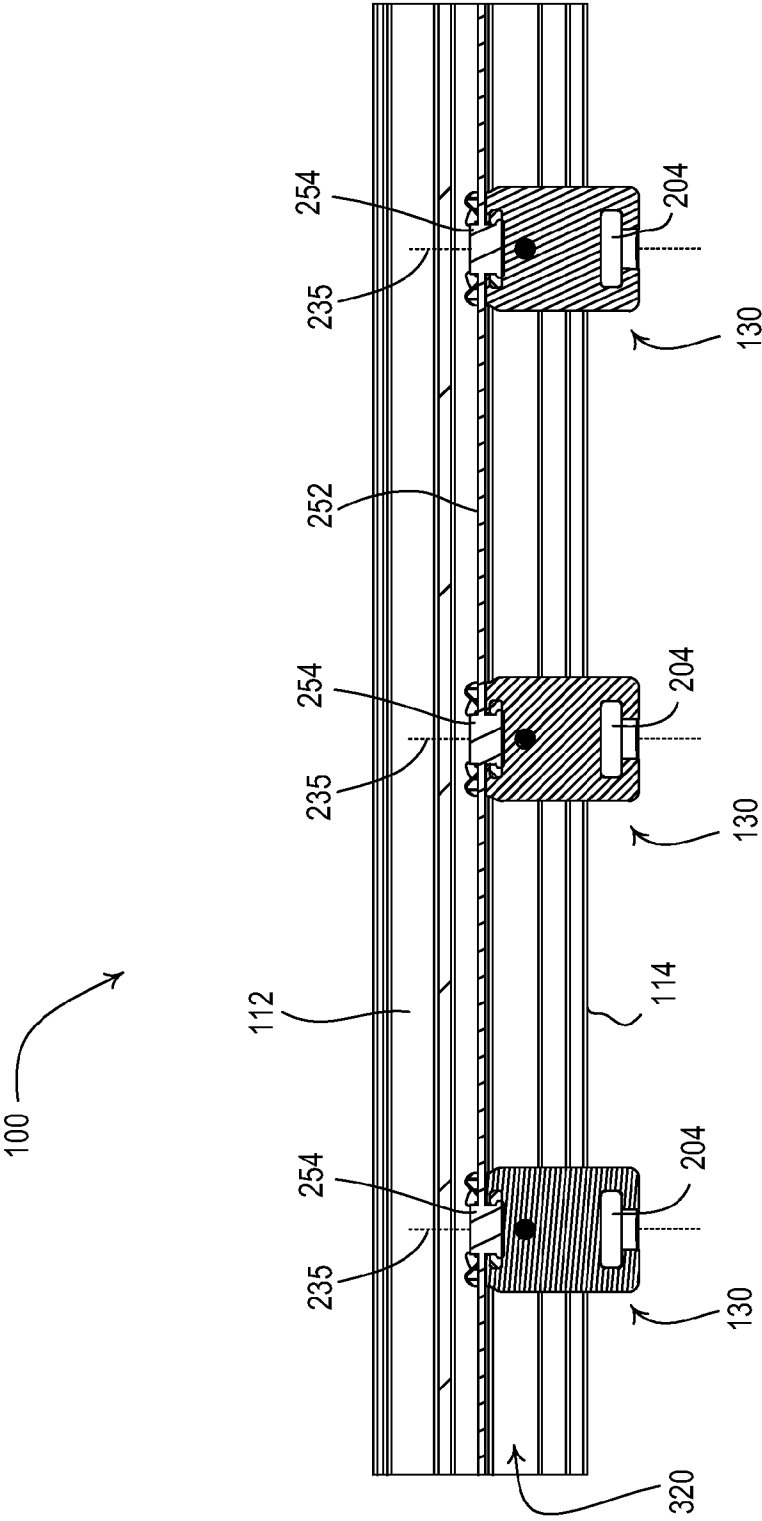


FIG. 5

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2023/020004

A. CLASSIFICATION OF SUBJECT MATTER

INV. A47H5/032 A47H15/02

ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A47H E06B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2020/196790 A1 (KO HOU SHENG [US]) 25 June 2020 (2020-06-25)	1, 2, 9, 11, 31-35, 43-47
A	figures 1, 2, 6-9 paragraphs [0001], [0002], [0029], [0033] - [0036] -----	3-8, 10, 12-30, 36-42
A	US 2012/145860 A1 (RUFFO FABIAN [US] ET AL) 14 June 2012 (2012-06-14) figures 6-11 -----	1-47
A	US 4 473 102 A (OHMAN THOR [US] ET AL) 25 September 1984 (1984-09-25) figures 10-15 -----	1-47



Further documents are listed in the continuation of Box C.



See patent family annex.

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

28 August 2023

Date of mailing of the international search report

07/09/2023

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2023/020004

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 2020196790	A1	25-06-2020	NONE	

US 2012145860	A1	14-06-2012	NONE	

US 4473102	A	25-09-1984	NONE	
